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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/713,863  
Filing Date: November 14, 2003  
Appellant(s): WOLSKA ET AL.

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Marc D. McSwain  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 12/10/08 appealing from the Office action mailed 7/28/08.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

(a) Claims 1, 4, 7-10, 12, 14, 16, 21-24, 26, 28, and 30 are rejected under 35 USC 103(a) as unpatentable over Foltz et al, US 6,356,864 in view of Brill et al., US 2004/0002994 A1 and Schabes et al, US 2004/0093567.

(b) Claim 5 is rejected under 35 USC 103(a) as unpatentable over Foltz, Brill, Schabes, and Mitchell

(c) Claims 11 and 25 are rejected under 35 USC 103(a) as unpatentable over Foltz, Brill, Schabes, and Mitchell.

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

#### **(8) Evidence Relied Upon**

6,356,864 B1	Foltz et al.	03-2002
2004/0002994 A1	Brill et al.	01-2004
2004/0093567 A1	SCHABES et al.	05-2004
2003/0149692 A1	MITCHELL	08-2003

#### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7-10, 12, 14, 16, 21-24, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz et al., US 6,356,864 B1, 03/12/02 in view of Brill et al., US 2004/0002994 A1, 01/01/04 (filed 06/27/02) and Schabes et al., US 2004/0093567 A1, 05/13/04 (filed 05/22/02).

In reference to claim 1, Foltz teaches a method for analysis and evaluation of the semantic content of a writing which meets the preamble, ***a method for automatically evaluating an essay to detect at least one writing style error***. See abstract. Foltz discloses the following:

-Evaluating a sample text, such as an essay or document of a student. The essay is read and stored which meets the limitation, ***electronically receiving an essay on a computer system***. See column 9, lines 44-50, column 10, lines 63-65, and figure 2, element 40.

-Creating trained matrices where a matrix is created by including unique terms used in two or more reference documents. The reference text is parsed into text objects and segments (Compare to **text segments**). The matrix is a text object (row) by segment (column) matrix. Each object is a unique word, concept, or phrase. Each cell entry represents the number of times the text object (i) appears in text segment (j). See column 10, lines 9-18. This meets the limitation, **assigning a feature value for each of one or more features for one or more text segments in the essay**. The segment vector represents individual reference documents. Each document is allocated a single vector in the data matrix. A weighted value is applied to each cell. This meets the limitation, **wherein the feature values are automatically calculated by the computer system**. The weighted cells are proportional representation of the importance of the cell's original information, for example, rare words are given more weight. See column 10, lines 18-29. The vector representation of at least one standard reference text used to create the data matrix is created. The vector representation of the standard reference text is the average of the text object vectors using each element of the text objects within the standard reference text. This is computed as the average of the sum of each element of the text object vectors in the corresponding document row in matrix DS. Similarly, a vector representation of the un-graded student essay is also generated. It is the average of the vector elements contained in the un-graded student essay. See column 10, lines 63-67 and column 11, 1-29. This meets the limitation, **storing the feature values for the one or more text segments on a data storage device accessible by the computer system**.

-Comparing a student's essay, the un-graded sample text, to a standard reference text, a pre-graded text. See column 9, lines 40-67. Computing similarities between the pseudo-object vector representation of the un-graded student essay and the vector representation of the pre-graded essay which meets the limitation, ***comparing the feature values fore ach one or more text segments with a model configured to identify at least one writing style error.*** See column 12, lines 28-67. The pre-graded or standard reference text is text that has either been manually typed by a user (i.e. human) or recited into a speech-to-text translator by a user (i.e. human) which meets the limitation, ***wherein the model is based on at least one human evaluated essay.*** See column 9, lines 63-67 and column 10, lines 1-6.

Foltz does not teach ***the model includes at least one decision tree to determine a probability associated with a likelihood of the at least one writing style error.***

Brill discloses an error model used to predict various errors via probabilities using a decision tree such as the likelihood of letters and sequences being added and deleted which meets the limitation, ***the model includes at least one decision tree to determine a probability associated with a likelihood of the at least one writing style error.*** See pages 4,-5 paragraph [0051].

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include Brill's model with a decision tree to determine a probability associated with an error in the system of Foltz in order to determine the likelihood of a

writing style error because it was desirable at the time of the invention to facilitate error correction automatically based on previous user activity. See pages 1-2.

Foltz does not teach, ***displaying an indication of an identified writing style error***. Schabes discloses a spelling and grammar checking system in which a spelling suggestion module suggests corrections for misspelled words. The spelling suggestion module determines a list of replacement words for the identified misspelled word and determines a list of alternate words. The module also identifies portions of the misspelled word that sound similar to portions of the correctly spelled words. The list of alternative words that is output by the suggestion module is passed to the automaton conversion module. See page 5, paragraphs [0066]-[0068], page 9, paragraph [0107] and figure 11. Figure 11 illustrates a list of alternates for a word that misspelled. In displaying a list of alternates, Schabes discloses, "displaying an indication of an identified writing style error".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate Schabes' displaying of an indication of an identified writing style error in the system of Foltz because it was desirable at the time of the invention to highlight errors in a document such as misspelled words, incorrectly-used words, and contextual and grammatical errors in order to make corrections. See page 1, paragraph [0004]-[0014].

**In reference to claim 4**, Foltz's system computes similarities between the pseudo-object vector representation of the un-graded student essay and the vector



representation of the pre-graded essay. See column 12, lines 28-67. This entails determining similarities about the frequency of a text object in a text segment. This also provides diagnostic information about the subject-matter present or lacking in the un-graded essay. See column 12, lines 54-67 and column 13, lines 1-2. Compare to ***“presence or absence of features associated with each word in the essay”***.

**In reference to claim 7**, Foltz teaches creating trained matrices where a matrix is created by including unique terms used in two or more reference documents. The reference text is parsed into text objects and segments. The matrix is a text object (row) by segment (column) matrix. Each object is a unique word, concept, or phrase. Each cell entry represents the number of times the text object (i) appears in text segment (j). See column 10, lines 9-18. Foltz teaches each cell value for the text object that is vector element, is summed over the entire row in the semantic-space matrix. This is the average of the vector elements the un-graded essay contains. See column 11, lines 8-17. Compare to ***“ratio of evaluated text segment occurrences in the essay to the total number of text segments in the essay”***.

**In reference to claim 8**, Foltz teaches each cell value for the text object that is vector element, is summed over the entire row in the semantic-space matrix. This is the average of the vector elements the un-graded essay contains. See column 11, lines 8-17. Foltz further discloses comparing a vector for each sentence wherein each sentence is compared to the following sentence within the same paragraph or next

paragraph. See column 14, lines 60-67. Compare to ***“the average, over all paragraphs of the essay, of the ratio of evaluated text segment occurrences in a paragraph of the essay to the total number of text segments in the paragraph”***

**In reference to claim 9**, Foltz teaches each cell value for the text object that is vector element, is summed over the entire row in the semantic-space matrix. This is the average of the vector elements the un-graded essay contains. See column 11, lines 8-17. Foltz further discloses comparing a vector for each sentence wherein each sentence is compared to the following sentence within the same paragraph or next paragraph. See column 14, lines 60-67.

**In reference to claim 10**, Foltz teaches in column 1, lines 40-50, that the related prior art teaches calculating sentence length.

**In reference to claim 12**, Foltz teaches that word proximity in a document helps determine the frequency of words and semantic coherence of an essay. See column 1, lines 19-64. The proximity of words and frequency of words help determine the importance of the word and also the relevance of subject matter. The proximity of a word is defined as the distance between two words. Compare to ***“interval distance between consecutive text segment occurrences”***. Foltz teaches

using word proximity between consecutive word occurrences in order to determine if a word is being used excessively in an essay and help minimize repetitiveness while improving coherency of the essay. See column 1.

**In reference to claim 16**, Foltz teaches a method for analysis and evaluation of the semantic content of a writing. See abstract. Compare to **a system for automatically evaluating an essay to detect at least one writing style error**. Foltz discloses the following:

-Evaluating a sample text, such as an essay or document of a student. The essay is read and stored. See column 9, lines 44-50, column 10, lines 63-65, and figure 2, element 40. Compare to **a computer system configured to electronically receive an essay**.

-Creating trained matrices where a matrix is created by including unique terms used in two or more reference documents. The reference text is parsed into text objects and segments (Compare to **text segments**). The matrix is a text object (row) by segment (column) matrix. Each object is a unique word, concept, or phrase. Each cell entry represents the number of times the text object (i) appears in text segment (j). See column 10, lines 9-18. Compare to **a feature extractor configured to assign a feature value for each of one or more features for one or more text segments in the essay**. The segment vector represents individual reference documents. Each document is allocated a single vector in the data matrix. A weighted value is applied to each cell. The weighted cells are proportional representation of the importance of the

cell's original information, for example, rare words are given more weight. See column 10, lines 18-29. The vector representation of at least one standard reference text used to create the data matrix is created. The vector representation of the standard reference text is the average of the text object vectors using each element of the text objects within the standard reference text. This is computed as the average of the sum of each element of the text object vectors in the corresponding document row in matrix DS. Similarly, a vector representation of the un-graded student essay is also generated. It is the average of the vector elements contained in the un-graded student essay. See column 10, lines 63-67 and column 11, 1-29. Compare to ***a data storage device, connected to a computer system, configured to store the feature values for the one or more text segments.***

-Comparing a student's essay, the un-graded sample text, to a standard reference text, a pre-graded text. See column 9, lines 40-67. Computing similarities between the pseudo-object vector representation of the un-graded student essay and the vector representation of the pre-graded essay. See column 12, lines 28-67. Compare to ***"a feature analyzer configured to evaluate the essay for at least one writing style error by comparing the feature values for each of one or more text segments with a model.*** The pre-graded or standard reference text is text that has either been manually typed by a user (i.e. human) or recited into a speech-to-text translator by a user (i.e. human). See column 9, lines 63-67 and column 10, lines 1-6.

-Assigning a grade to the un-graded student essay based on the computing of similarities between the pseudo-object vector representation of the un-graded student essay and the vector representation of the pre-graded essay. See column 12, lines 28-67. Determining a degree of similarity between the two documents in order to assign a grade to the essay entails determining the errors. See columns 13-14. Outputting the graded essay. Compare to ***a display for presenting the evaluated essay***.

Foltz does not teach *the model includes at least one decision tree to determine a probability associated with a likelihood of the at least one writing style error*.

Brill discloses an error model used to predict various errors via probabilities using a decision tree such as the likelihood of letters and sequences being added and deleted which meets the limitation, ***the model includes at least one decision tree to determine a probability associated with a likelihood of the at least one writing style error***. See pages 4,-5 paragraph [0051].

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include Brill's model with a decision tree to determine a probability associated with an error in the system of Foltz in order to determine the likelihood of a writing style error because it was desirable at the time of the invention to facilitate error correction automatically based on previous user activity. See pages 1-2.

Foltz does not teach, "wherein the evaluated essay includes an indication of at least one identified writing style error". Schabes discloses a spelling and grammar checking system in which a spelling suggestion module suggests corrections for

misspelled words. The spelling suggestion module determines a list of replacement words for the identified misspelled word and determines a list of alternate words. The module also identifies portions of the misspelled word that sound similar to portions of the correctly spelled words. The list of alternative words that is output by the suggestion module is passed to the automaton conversion module. See page 5, paragraphs [0066]-[0068], page 9, paragraph [0107] and figure 11. Figure 11 illustrates a list of alternates for a word that misspelled. In displaying a list of alternates, Schabes discloses, "displaying an indication of an identified writing style error".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate Schabes' displaying of an indication of an identified writing style error in the system of Foltz because it was desirable at the time of the invention to highlight errors in a document such as misspelled words, incorrectly-used words, and contextual and grammatical errors in order to make corrections. See page 1, paragraph [0004]-[0014].

**In reference to claim 21**, Foltz teaches creating trained matrices where a matrix is created by including unique terms used in two or more reference documents. The reference text is parsed into text objects and segments. The matrix is a text object (row) by segment (column) matrix. Each object is a unique word, concept, or phrase. Each cell entry represents the number of times the text object (i) appears in text segment (j). See column 10, lines 9-18. Foltz teaches each cell value for the text object that is vector element, is summed over the entire row in the semantic-space

matrix. This is the average of the vector elements the un-graded essay contains. See column 11, lines 8-17. Compare to ***“ratio of evaluated text segment occurrences in the essay to the total number of text segments in the essay”***.

**In reference to claim 22**, Foltz teaches each cell value for the text object that is vector element, is summed over the entire row in the semantic-space matrix. This is the average of the vector elements the un-graded essay contains. See column 11, lines 8-17. Foltz further discloses comparing a vector for each sentence wherein each sentence is compared to the following sentence within the same paragraph or next paragraph. See column 14, lines 60-67. Compare to ***“the average, over all paragraphs of the essay, of the ratio of evaluated text segment occurrences in a paragraph of the essay to the total number of text segments in the paragraph”***

**In reference to claim 23**, Foltz teaches each cell value for the text object that is vector element, is summed over the entire row in the semantic-space matrix. This is the average of the vector elements the un-graded essay contains. See column 11, lines 8-17. Foltz further discloses comparing a vector for each sentence wherein each sentence is compared to the following sentence within the same paragraph or next paragraph. See column 14, lines 60-67.

**In reference to claim 24**, Foltz teaches in column 1, lines 40-50, that the related prior art teaches calculating sentence length.

In reference to claim 26, Foltz teaches that word proximity in a document helps determine the frequency of words and semantic coherence of an essay. See column 1, lines 19-64. The proximity of words and frequency of words help determine the importance of the word and also the relevance of subject matter. The proximity of a word is defined as the distance between two words. Compare to ***“interval distance between consecutive text segment occurrences”***. Foltz teaches using word proximity between consecutive word occurrences in order to determine if a word is being used excessively in an essay and help minimize repetitiveness while improving coherency of the essay. See column 1.

In reference to claims 14 and 28, Foltz teaches that word proximity in a document helps determine the frequency of words and semantic coherence of an essay. See column 1, lines 19-64. The proximity of words and frequency of words help determine the importance of the word and also the relevance of subject matter. The proximity of a word is defined as the distance between two words or an interval distance. Foltz teaches using word proximity between consecutive word occurrences in order to determine if a word is being used excessively in an essay and help minimize repetitiveness while improving coherency of the essay. See column 1.

“Using word proximity” as taught by Foltz is analogous to determining the number of intervening words or characters because word proximity is the distance between two words or characters and is determined by somehow calculating the distance between the number of intervening words. Thus it would have been obvious to a person of



ordinary skill in the art at the time of the invention to interpret Foltz's teachings of determining word proximity as entailing the calculation of the distance between intervening words.

**In reference to claim 30**, Foltz teaches the pre-graded or standard reference text is text that has either been manually typed by a user (i.e. human) or recited into a speech-to-text translator by a user (i.e. human). See column 9, lines 63-67 and column 10, lines 1-6.

Claims 5, 11, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz et al., US 6,356,864 B1, 03/12/02 in view of Brill et al., US 2004/0002994 A1, 01/01/04 (filed 06/27/02), Schabes et al., US 2004/0093567 A1, 05/13/04 (filed 05/22/02), as applied to claims 1 and 16 above, and further in view of Mitchell, US 2003/0149692 A1, 08/07/03.

**In reference to claim 5**, Foltz does not expressly teach function words of the essay are not considered by the computer system in determining feature values.

Mitchell teaches that in the semantic analysis of process 4 the syntactic structure is pruned of **superfluous words** which meets the limitation, ***wherein the function words of the essay are not considered by the computer system in determining feature values.*** See page 1, paragraphs [0017]-[0018] and page 4, paragraph [0114]. Further, Mitchell teaches the electronic assessment of free-form text against a standard

for such text in which templates prepared from the standard are compared with semantically-syntactically tagged form of the free-form text and an output assessment is derived from the comparison. Mitchell teaches extracting propositions, adjectives, etc from the mark scheme answers to reduce variant forms of these words to their root form. The intent is to help simplify the word recognition and sentence analysis process by reducing the number of variations of the words. Thus certain words of the essay are not considered by the assessment tool since they are altered to the reduce variant form. See pages 1-3, paragraphs [0041]-[0067].

It would have been obvious to a person of ordinary skill in the art at the time of the invention to not consider certain words when determining feature values to simplify the word recognition and sentence analysis process by reducing the number of variations of the words.

**In reference to claims 11 and 25,** Foltz does not expressly teach the feature values comprise a value indicated whether a text segment includes a pronoun.

Mitchell teaches parsing a free-form text answer into constituent parts including nouns, verbs, adjectives, and proper names. See page 1, paragraphs [0003] and [0015]. The nouns are pattern matched in the student answer against nouns in the mark scheme. See figure 7.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to substitute Mitchell's indication of whether a noun is present as a feature of an essay in the system of Foltz with an indication of whether a pronoun is present as

a feature of an essay because one of ordinary skill in the art would have been able to carry out such a substitution, and the results were reasonably predictable. Further, such a substitution would take into account potential variations in writing styles by matching potential variations of the pronoun to a word in the student answer/essay.

### **(10) Response to Argument**

#### **(a) Claims 1, 4, 7-10, 12, 14, 16, 21-24, 26, and 28**

On pages 4-5, Appellant argues independent claims 1 and 16 are not obvious over the cited art but does not provide any reasons why. Appellant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. The Appellant generally argues the non-entered amendments filed on 09/18/08 more clearly defined the invention by eliminating misspellings as among the writing style errors.

Examiner disagrees that the proposed amendments simplified matters for appeal or placed the application in condition for allowance. As an initial matter, limitations in the preamble are not given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535

F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). Further, incorporating claim 5 into the independent claim was not deemed to simplify matters for appeal.

Appellant argues the Board should consider amendments not entered. Since the limitations appear in dependent claims 5 and 30 they will be addressed with respect to Appellant's arguments in section (b) and (c) below. It is noted the Appellant has not argued any subject matter from claims **1, 4, 7-10, 12, 14, 16, 21-24, 26, and 28** except to state that the claims should be considered in light of the non-entered amendments.

**(b) Claims 5 and 30.**

Appellant argues claims 5 and 30 together; however, the claims recite different limitations. For instance, claim 5 recites, *wherein the function words of the essay are not considered by the computer system in determining feature values*. Claim 30 recites, *wherein the model is generated using at least one human evaluated essay*.

With respect to claim 5, Appellants argue Mitchell teaches away from not considering the function words of the essay because the function words are converted to a reduced variant form so that they can be considered.

Examiner disagrees.

Mitchell teaches that in the semantic analysis of process 4 the syntactic structure is pruned of **superfluous words** which meets the limitation, *wherein the function words of the essay are not considered by the computer system in determining feature values*. See page 1, paragraphs [0017]-[0018] and page 4, paragraph [0114]. Further, Mitchell

teaches the electronic assessment of free-form text against a standard for such text in which templates prepared from the standard are compared with semantically-syntactically tagged form of the free-form text and an output assessment is derived from the comparison. Mitchell teaches **extracting propositions, adjectives, etc from the mark scheme answers to reduce variant forms of these words to their root form. The intent is to help simplify the word recognition and sentence analysis process by reducing the number of variations of the words. Thus certain words of the essay are not considered by the assessment tool since they are altered to the reduce variant form.** See pages 1-3, paragraphs [0041]-[0067]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to not consider certain words when determining feature values to simplify the word recognition and sentence analysis process by reducing the number of variations of the words.

In teaching that superfluous words are eliminated and remaining function words are extracted and transformed to a different form, the “function words” are not themselves considered because they are either eliminated all together or transformed to a variant form.

It is noted that the Appellant does not argue claim 30 separately.

#### **(c) Claims 11 and 25**

On pages 6-7, Appellant argues claims 11 and 25 together. The claims recite, *the feature values comprise a value indicating whether the text segment includes a pronoun.* Appellant argues Mitchell teaches processing nouns, but not pronouns.

Examiner disagrees because it would have been obvious to a person of ordinary skill in the art at the time of the invention to **substitute** Mitchell's indication of whether a noun is present as a feature of an essay in the system of Foltz with an indication of whether a pronoun is present as a feature of an essay because one of ordinary skill in the art would have been able to carry out such a substitution, and the results were reasonably predictable.

Specifically, Foltz does not expressly teach the feature values comprise a value indicated whether a text segment includes a pronoun. Mitchell teaches parsing a free-form text answer into constituent parts including nouns, verbs, adjectives, and proper names. See page 1, paragraphs [0003] and [0015]. The nouns are pattern matched in the student answer against nouns in the mark scheme. See figure 7. It would have been obvious to a person of ordinary skill in the art at the time of the invention to substitute Mitchell's indication of whether a noun is present as a feature of an essay in the system of Foltz with an indication of whether a pronoun is present as a feature of an essay because one of ordinary skill in the art would have been able to carry out such a substitution, and the results were reasonably predictable. Further, such a substitution would take into account potential variations in writing styles by matching potential variations of the pronoun to a word in the student answer/essay.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Art Unit: 2176

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Rachna S Desai/

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